

## Food Chemistry Fundamentals (16:400:513): Fall 2014

Course Coordinator: Tung-Ching Lee  
(848-932-5536; [lee@aesop.rutgers.edu](mailto:lee@aesop.rutgers.edu); 321B CAFT)

### **Faculty:**

Michael Rogers (848-932-5520; [rogers@aesop.rutgers.edu](mailto:rogers@aesop.rutgers.edu); 221D CAFT)  
Chi-Tang Ho (848-932-5553; [ho@aesop.rutgers.edu](mailto:ho@aesop.rutgers.edu); 321C CAFT)  
Richard Ludescher (848-932-3516; [ludescher@aesop.rutgers.edu](mailto:ludescher@aesop.rutgers.edu); 216 Martin Hall)

Please direct any questions about the course *per se* to the course coordinator Lee; direct any questions about specific content of classes to the relevant instructor.

### **Required Text:**

(Available at the Cook/Douglass bookstore, Nichol Ave., Cook/Douglass Campus) *Fennema's Food Chemistry*, 4<sup>th</sup> Ed. 2008. S. Damodaran, K. L. Parkin, & O. R. Fennema, editors. CRC Press, Boca Raton, FL.

### **Description of the Course:**

This course is a survey of the chemistry of food molecules, their interactions in foods, and their contributions to the quality and shelf-life of foods. Specific sections of the course will cover water, physical properties, lipids, proteins, carbohydrates, bioactive components and food colors, and interactions among food molecules in specific foods.

The course will emphasize relationships between the chemical structure, reactivity, and physical properties of food molecules and the properties of the foods of which they are a part.

### **Topics to be covered:**

- Thermodynamic and kinetics parameters effecting food stability
- Physicals concepts in complex food systems
- Water chemistry and physics
  - Emulsion stability
  - Surface chemistry
  - Hydration of ions and small molecules
  - Water activity and reaction rates
- Lipid chemistry
  - Chemical structure of lipids
  - Physical properties of lipids
  - Deteriorative reactions
  - Chemical alterations in industrial lipids
- Carbohydrate chemistry
  - Chemical structures and reactions
  - Functional properties

- Applications
- Protein chemistry
- Chemical structures and reactions
- Functional properties
- Vitamins
- Sources, functions and deficiencies
- Characteristics of vitamins
- Structures, reactions and stability
- Bioactives

### **Learning Goal**

Provide foundational knowledge rooted in fundamental chemistry and physics to impart practical understanding of complex issues in food science.

### **Expected Outcomes**

- Students will master physical and chemical aspects of foods in determined quality and safety of foods.
- Students will develop the ability to integrate concepts, across units, in solving common industrial issues.
- The students will garner tools rooted in foundational chemistry that will be applicable broadly to food chemistry and physics.
- 

### **Evaluation**

Your course grade will be determined by your performance on three exams equally weighted as well as class participation.

### **Academic Integrity**

All students are expected and required to be familiar with the rules and regulations of Rutgers University dealing with academic integrity and issues of cheating and/or plagiarism of intellectual material from either printed or electronic sources. Any suspected instance of a violation of these rules will be reported to the appropriate university officials and will be handled strictly in accordance with established university policies.

Such a violation can result in consequences ranging from receiving zero credit for a test to receiving a failing grade in this class to permanent expulsion from Rutgers University with an indication of this action placed on your permanent University record. Further information is available at the Academic Integrity web site:

<http://academicintegrity.rutgers.edu/academic-integrity-at-rutgers>